Re: AM-based JEM strategy

Bob Benson to: Bill Brattin 06/15/2012 11:28 PM

From: Bob Benson/R8/USEPA/US
To:

After a five minute review on my return from DC tonight, this looks like a reasonable approach. I will review in more detail over the weekend. We should talk on Monday. I noted a somewhat tangled message from Grace LeMasters. I think she meant to say that UC will review the approach and offer comments. Your approach is somewhat more complicated than the approach I used, but it has a great advantage that it does not allow the less than zero problem that I found. I have not had time to compare the values, but will do so before Monday.
The issue about engineering controls not affecting the values for track expander and track unload only applies to the time period between 1957 and 1972 when no IH data are available. In 1972 and later only actual IH data were used. I don't see an alternative to using the IH data as is after 1972 for all areas in the facility.
Did you see any evidence of bias resulting from the different sampling times for the IH data. I only forwarded the data to Danielle without looking at it during my trip (perhaps a mistake). I will look at it in more detail before Monday.
Were you able to locate all the values that were based on 1/2 LOD and set them equal to 0 before you did the fitting exercise? I assume so otherwise you probably would not have proceeded.
I will be in the office only Monday and Tuesday. I leave for vacation in Switzerland on June 20 and will return to the office on June 28.
-----"Brattin, Bill" <brattin@srcinc.com> wrote: -----
To: "Hilbert, Timothy (hilbertj)" <HILBERTJ@UCMAIL.UC.EDU>, Bob Benson/R8/USEPA/US@EPA, David Berry/R8/USEPA/US@EPA
From: "Brattin, Bill" <brattin@srcinc.com>
Date: 06/15/2012 08:43AM
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Subject: AM-based JEM strategy
Here is an Excel spreadsheet that offers one potential approach to fitting and extrapolating concentration values by year by area to generate the JEM based on un-transformed data.
This is intended to be just a starting point for discussion, and

should not be confused with a decision or even a recommendation.
In brief, here is what I did:
Step 1: Fit the IH data from 1972-1994.
I used a simple exponential model: y = a*exp(-bx), and fit the model to the data using minimization of square errors.
This model has the advantage that it can not go below zero, and it can take on a nearly linear form (if the data suggest that is appropriate).
I did not investigate other models, although it seems likely that other modeling strategies might be appropriate.
I first fit the data for each area independently, then I fit the data for all area simultaneously (assuming a constant b for all areas).
This approach would make sense if the rates of decrease over time were generally similar between areas.
[Note: Appendix F says that engineering changes in the trionizing area to reduce dust levels are not expected to impact the tract area.
However, the concentrations in the track and track unload areas appear to tend to decrease between 1972 and 1980. If so, why is this?]
Step 2: Extrapolate back in Time
Next, I used the model-predicted value for 1972 to extrapolate backward to 1957.
I did this both for the simultaneous fit (JEM-1) and fir the 4 independent fit(JEM-2) approaches.
I tried to do this extrapolation in the same way as described in Appendix F, although I am not sure I did this correctly.
Step 3: Extrapolate ahead in time
For the interval from 1994 to 2000, I just let the model predict the values (forward extrapolation).
Alternatively, we could just use the model value from 1994 and hold them constant (as was done in Appendix F).
Not much difference either way.
Please review and send comments when possible.
Then, lets follow up with a conference call to resolve issues and choose the best plan.
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[attachment "Draft JEM Based on AM Values v1.xlsx" removed by Bob Benson/R8/USEPA/US]